What is claimed is:

1. A method of performing error correction of transmitted information comprising:

    5   encoding a stream of data using concatenated reed-solomon and turbo-code error correcting codes;

communicating said encoded data over a transmission system; and

decoding said encoded data using said reed-solomon and said turbo-code error correcting codes.

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2. A method according to claim 1, wherein said transmission system is a long-haul transmission system.

3. A method according to claim 1, wherein said long haul transmission system communicates said encoded data at least 600 kilometers.

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4. A method according to claim 1, wherein said encoding comprises:

packing said stream of data into a frame of first blocks;

generating said reed-solomon code for each of said first blocks;

  20   appending said reed-solomon code to said first blocks to create a second frame of second blocks;

packing said second frame of second blocks into a third frame of third blocks; and

generating said turbo-code using said third blocks to create a fourth frame.

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5. A method according to claim 4, wherein a length of said second frame matches a length of said third frame.

6. A method according to claim 4, wherein a length of said second frame is less than a length of said third frame.

7. A method according to claim 6, further comprising padding said third frame with padding symbols until said length of said third frame matches said length of said second frame.

8. A method according to claim 4, wherein said packing said second frame of second blocks into a third frame of third blocks comprises interleaving said second blocks into said third blocks.

9. A method according to claim 8, wherein said interleaving comprises bit interleaving.

10. A method according to claim 8, wherein said interleaving comprises byte interleaving.

11. A method according to claim 8, wherein said third frame has a number 1-N of third blocks, with N matching an interleave depth for said encoding.

12. A method of claim 11, wherein N is at most 64.

13. A method of claim 11, wherein N is 16.

14. A method according to claim 1, wherein said reed-solomon error correcting code is (255/247) code and said turbo-code is a (64,57) TPC code.

15. A method according to claim 1, wherein said turbo-code is one of a group comprising turbo convolutional codes and turbo product codes.

16. A method according to claim 4, wherein said decoding comprises:
recovering said turbo-code and said third blocks from said fourth frame;
correcting errors for said third blocks using said turbo code;
unpacking said second blocks from said third blocks;
recovering said reed-solomon code and said first blocks from said second blocks; and
correcting errors for said first blocks using said reed-solomon code.

17. A machine-readable medium whose contents cause a computer system to perform error correction comprising:
encoding a stream of data using concatenated reed-solomon and turbo-code error correcting codes;
communicating said encoded data over a transmission system; and
decoding said encoded data using said reed-solomon and turbo-code error correcting codes.

18. A machine-readable medium according to claim 17, wherein said transmission system is a long-haul transmission system.

19. A machine-readable medium according to claim 17, wherein said long haul transmission system communicates said encoded data at least 600 kilometers.

20. A machine-readable medium according to claim 17, wherein said encoding comprises:

packing said stream of data into a frame of first blocks;

generating said reed-solomon code for each of said first blocks;

appending said reed-solomon code to said first blocks to create a second frame of second blocks;

packing said second frame of second blocks into a third frame of third blocks; and

generating said turbo-code using said third blocks to create a fourth frame.

21. A machine-readable medium according to claim 20, wherein a length of said second frame matches a length of said third frame.

22. A machine-readable medium according to claim 20, wherein a length of said second frame is less than a length of said third frame.

23. A machine-readable medium according to claim 22, said method further comprising padding said third frame with padding symbols until said length of said third frame matches said length of said second frame.

24. A machine-readable medium according to claim 20, wherein said packing said second frame of second blocks into a third frame of

third blocks comprises interleaving said second blocks into said third blocks.

25. A machine-readable medium according to claim 24, wherein said interleaving comprises bit interleaving.

26. A machine-readable medium according to claim 24, wherein said interleaving comprises byte interleaving.

27. A machine-readable medium according to claim 24, wherein said third frame has a number 1-N of third blocks, with N matching an interleave depth for said encoding.

28. A machine-readable medium of claim 27, wherein N is at most 64.

29. A machine-readable medium of claim 27, wherein N is 16.

30. A machine-readable medium according to claim 17, wherein said reed-solomon error correcting code is (255/247) code and said turbo-code is a (64,57) TPC code.

31. A machine-readable medium according to claim 17, wherein said turbo-code is one of a group comprising turbo convolutional codes and turbo product codes.

32. A machine-readable medium according to claim 20, wherein said decoding comprises:

recovering said turbo-code and said third blocks from said fourth frame;

correcting errors for said third blocks using said turbo code;

unpacking said second blocks from said third blocks;

recovering said reed-solomon code and said first blocks from said second blocks; and

correcting errors for said first blocks using said reed-solomon code.

33. An apparatus for performing error correction, comprising:

a forward error correction encoder configured to encode a stream of data using concatenated reed-solomon and turbo-code error correcting codes; and

a transceiver coupled to said encoder to communicate said encoded stream of data over a transmission system.

34. An apparatus according to claim 33, wherein said transmission system is a long-haul transmission system.

35. An apparatus according to claim 33, wherein said encoder comprises:

a first level encoder configured to encode said stream of data using said reed-solomon code;

an interleaver configured to interleave said first level encoded stream of data; and

a second level encoder configured to encode said interleaved stream of data using said turbo-code.

36. An apparatus according to claim 33, wherein said reed-solomon error correcting code is (255/247) code and said turbo-code is a (64,57) TPC code.

5   37. An apparatus according to claim 33, wherein said turbo-code is one of a group comprising turbo convolutional codes and turbo product codes.

38. An apparatus for performing error correction, comprising:

10   a transceiver configured to receive an encoded stream of data from a transmission system, said encoded stream of data being encoded using concatenated reed-solomon and turbo-code error correcting codes; and

a forward error correction decoder configured to decode said

15   encoded stream of data using said reed-solomon and turbo-code error correcting codes.

39. An apparatus according to claim 38, wherein said transmission system is a long-haul transmission system.

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40. An apparatus according to claim 38, wherein said decoder comprises:

a first level decoder configured to decode said encoded stream of data using said turbo-code;

25   a deinterleaver configured to deinterleave said first level decoded stream of data; and

a second level decoder configured to decode said deinterleaved stream of data using said reed-solomon code.

41. An apparatus according to claim 38, wherein said reed-solomon error correcting code is (255/247) code and said turbo-code is a (64,57) TPC code.

42. An apparatus according to claim 38, wherein said turbo-code is one of a group comprising turbo convolutional codes and turbo product codes.

43. A system for performing error correction, comprising:

a forward error correction encoder configured to encode a data stream using concatenated reed-solomon and turbo-code error correcting codes;

a long-haul communication network configured to communicate said encoded stream over a distance of at least 600 kilometers; and

a forward error correction decoder configured to decode said encoded data stream using said concatenated reed-solomon and turbo-code error correcting codes.